Scientific Inquiry

8-1 The student will demonstrate an understanding of technological design and scientific inquiry, including process skills, mathematical thinking, controlled investigative design and analysis, and problem solving.

8-1.2 Recognize the importance of a systematic process for safely and accurately conducting investigations.

Taxonomy Level: 1.1-B Remember Conceptual Knowledge

Previous/Future knowledge: In 4th grade (4-1.3), students summarized the characteristics of a simple scientific investigation that represent a fair test (including a question that identifies the problem, a prediction that indicates a possible outcome, a process that tests one manipulated variable at a time, and results that are communicated and explained). In 5th grade (5-1.3), students planned and conducted controlled scientific investigations, manipulating one variable at a time. In 7th grade, students explained the reasons for testing one independent variable at a time in a controlled scientific investigation (7-1.3) and explained the importance that repeated trials and a well-chosen sample size have with regard to the validity of a controlled scientific investigation (7-1.4).

It is essential for students to know that if the results of a scientific investigation are to be considered valid there must be a systematic process for conducting the investigation. This process must be designed safely and accurately.

A scientific investigation that is conducted accurately involves:

- Using appropriate tools safely and accurately
- Making careful measurements
- Using mathematical formulas appropriately
- Representing numbers with appropriate units of measurement where applicable
- Recording data in organized graphs, tables, and charts

Assessment Guidelines

The objective of this indicator is to *recognize* the importance of a systematic process for safely and accurately conducting investigations; therefore, the primary focus of assessment should be to remember that an investigation should be organized, safe, and accurate. However, appropriate assessments should also require students to *identify* ways to safely and accurately conduct an investigation; or *recall* conditions necessary for a valid investigation.